

ASSOCIATION OF *PITYOPHTHORUS OPIMUS* WITH
PISSODES TERMINALIS IN COLORADO LODGEPOLE PINE
(COLEOPTERA:SCOLYTIDAE & CURCULIONIDAE)

ROBERT E. STEVENS

Rocky Mountain Forest and Range Experiment Station,¹
U. S. Department of Agriculture, Forest Service, Fort Collins, Colorado
80521

ABSTRACT

Pityophthorus opimus Blackman is reported as an associate of *Pissodes terminalis* Hopping in Colorado *Pinus contorta* Dougl. These observations constitute new host and locality records for *P. opimus* and also indicate an example of commensalism between the 2 beetle species.

Pityophthorus opimus Blackman is widely distributed throughout the western United States, but little is known of its life history and ecological relationships. Blackman (1928) initially reported it from *Picea engelmannii* Parry from the Capitan Mountains, New Mexico, from several Colorado localities, and also from *Pinus flexilis* James in Colorado. Bright (1964) described it as *P. aristatae* from *Pinus aristata* Engelm. in the White Mountains, Mono County, California, but subsequently (1971) concluded his specimens in fact represented *P. opimus*.

I commonly find *P. opimus* in terminals of lodgepole pine, *Pinus contorta* Dougl., that have been attacked by the lodgepole terminal weevil, *Pissodes terminalis* Hopping, along the Front Range of the Rocky Mountains in northern Colorado. It appears to have a 1-year life cycle, with emergence and oviposition occurring in midsummer. By this time *Pissodes* have fed, oviposited, and emerged (my unpublished data), and the attacked terminals have begun to dry out. This presumably provides a suitable environment for development of *P. opimus*. Successful infestation of the terminal by *Pissodes* is not required for success of *P. opimus*; broods of the latter are sometimes found in leaders killed by *Pissodes*, but in which no weevils develop. In my observations *P. opimus*, like its associate, infests only terminals. I have not found it in laterals.

The relationships of these 2 species to each other provides an example of commensalism. The *Pissodes* in effect prepare the site for the *Pityophthorus*. *Pissodes* larvae occupy portions of the phloem area for only a short while, then they move to the pith. The *Pityophthorus* eggs hatch about the time the weevils migrate to the pith, and the remaining phloem area (usually a more than adequate amount) is left for the use of the scolytids.

Three species of parasitic Hymenoptera were collected from *P. opimus* galleries. These include *Eurytoma tomici* Ashmead (Eurytomidae) and *Rhopalicus pulchripennis* (Crawford) and *Acerocephala atrovioleacea* (Crawford) (Pteromalidae). All these species are known parasitoids of conifer-infesting Coleoptera (Muesebeck and Krombein 1951).

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LITERATURE CITED

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 BRIGHT, D. E. 1964. Descriptions of three new species and new distribution records of California bark beetles. Pan-Pacific Ent. 40(3):165-170.
 BRIGHT, D. E. 1971. New species, new synonymies and new records of bark beetles from Arizona and California. Pan-Pacific Ent. 47(1):63-70.
 MUESEBECK, C. F. W., and KARL B. KROMBEIN. 1951. Hymenoptera of America north of Mexico—synoptic catalog. U.S. Dep. Agric., Agric. Monogr. 2:1-1420.



BOOK NOTICES

- A revision of the genus *Sennius* of North and Central America (Coleoptera: Bruchidae)** by Clarence D. Johnson and John M. Kingsolver. 1973. U. S. Dept. Agr. Tech. Bull. 1462:1-135; 141 Fig. (For sale by Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. \$1.75).
- Systematics of the genus *Coelocnemis* (Coleoptera: Tenebrionidae); a quantitative study of variation** by John T. Doyen. 1973. Univ. California Publ. in Ent. 73:1-120, 74 Fig. (For sale by Univ. California Press, 2223 Fulton St., Berkeley, CA 94720; \$3.50).
- A revision of the genus *Tachinus* (Coleoptera: Staphylinidae) of North and Central America** by J. M. Campbell. 1973. Mem. Ent. Soc. Canada 90:1-137; 189 Fig.
- A revision of the genus *Petalium* LeConte in the United States, Greater Antilles, and the Bahamas (Coleoptera: Anobiidae)** by E. J. Ford, Jr. 1973. U. S. Dept. Agr. Tech. Bull. 1467:1-40; 36 Fig. (For sale by Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. \$.45).
- The leaf beetles of Alabama (Coleoptera: Chrysomelidae)** by Edward U. Balsbaugh, Jr. & Kirby L. Hays. 1972. Auburn Univ. Exp. Sta. Bull. 441:1-223; 43 Fig.
- The scarab beetles of Florida (Coleoptera: Scarabaeidae), Part I. The *Laparosticti* (Subfamilies: Scarabaeinae, Aphodiinae, Hybosorinae, Ochodaeinae, Geotrupinae, and Acanthocerinae)** by Robert E. Woodruff. 1973. Arthropods of Florida and Neighboring Land Areas 8:1-220; 407 Fig. (For sale by Florida Dept. Agr., Div. Plant Industry, P. O. Box 1269, Gainesville, FL 32601. \$3.00)
- Klucze do Oznaczania Owadów Polski [Insects of Poland, Part XIX, 98d Curculionidae, subfamily Curculioninae]** by Stanislaw Smreczynski. 1972. 195 p.; 373 Fig. [In Polish] (Available in exchange from Polskie Prismo Ent., UL Cybulskiego 30, Wroclaw, Poland).